

*A History of Hagley Park,
Christchurch,
with
Special Reference to its
Botany.*

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Introduction.

Those who gain the summit of the Port Hills by means of the Bridle-path and look across the Canterbury Plains as they appear to-day can have little idea of the appearance they presented to the first Europeans who gazed upon them from a similar vantage-point in the “forties” of last century. They then spread out in a wide stretch of flat country “clothed with abundance of good pasture, singularly deficient in timber.”¹ Isolated patches of forest were to be seen at Riccarton, Papanui, Kaiapoi, and Rangiora. The Papanui Bush has long since disappeared, but the Riccarton Bush still stands, solitary remnant of the famous white-pine (*Podocarpus dacrydioides*) association. The site of the future city was more or less a swamp, interrupted in various parts by shingle-beds and sand-dunes, through which the little river Avon, then variously known as Teonotopo or Potoringamotu, wound its way amidst a thick growth of *Phormium*, niggerheads, and raupo.

The first permanent settlers on the Plains were the Deans brothers, who arrived in 1842 and decided to settle just on the fringe of the now well-known Riccarton Bush. An account of their first journey gives some idea of the general appearance of the early vegetation covering this district. The journey was made up the river from its mouth in a whaleboat as far as “The Bricks,” near the present Barbadoes Street Bridge. From that point a Maori canoe conveyed the party to the bend in the river close to the present Riccarton Road. During the whole river journey the canoe had to be forced through a thick growth of

¹ *Handbook for New Zealand*, by a late Magistrate, p. 326, 1848.

vegetation by pulling on the flax and niggerheads. When the little party left the river a path had to be made through the dense “entanglement of fern, tutu, tussock, bramble, spaniards, and other native growth, nearly breast-high.”² Such was the virgin state of the land on which the new city was to be built. The Canterbury Association had instructed their surveyors to choose as the site of the capital of their settlement a suitable block of land about 1,000 acres in area, and to lay out lines for the principal streets, squares, sites of public buildings, parks, &c., required for the convenience of the future inhabitant.³ After some hesitation as to the respective merits of the seaport and the inland site the latter was selected. One of the surveyors protested that the actual site chosen was too swampy, and considered the place on which the suburb of Woolston now stands to be drier and therefore a more desirable situation. He was overruled, however, by his more impetuous colleague, Captain Thomas, and the principal streets, squares, reserves, &c., were laid out as they now stand. As it was to be an ecclesiastical settlement, the principal streets were named after various bishoprics, the names being jumbled up together in a hat and drawn at random as required, so that no undue preference should be given. In this way did the main thoroughfares receive their names. With the large town reserve, however, it was different. This was named out of compliment to Lord Lyttelton, who was chairman of the Canterbury Association, and Hagley Park bears the name of his country seat in Staffordshire.

² *Canterbury Old and New*, p. 50, 1900.

³ *Handbook for New Zealand*, p. 19.

Size and Boundaries of the Park.

Out of the 1,000 acres an area approximating 500 acres was set aside, vested in the Queen, as a public park. In accordance with the request of the Deans brothers that the new town should not be placed too near their station, this reserve was placed on the west side of the town, between their station and the town buildings. Roughly speaking, it comprised all the land from the North Town Belt to the South Town Belt for a width of sixty chains. By the Canterbury Association Ordinance of 1855 the land known as Hagley Park was declared to be reserved for ever as a public park, and to be open for the recreation and enjoyment of the public; and it was provided that it should be lawful for the Superintendent to set apart so much of the land as he should think fit for plantations, gardens, and places for public amusement, and to lay out public roads through it. He had power, also to let it.

The original reserve includes the grounds now occupied by the Hospital, the Acclimatization Society, and Christ's College. By the year 1855 the ten acres belonging to Christ's College had already been handed over to the College authorities in exchange for land owned by the College in the centre of Cathedral Square, and it is so specified in the Canterbury Association Ordinance referred to above. In 1863 the Provincial Council by an Ordinance transferred 5 acres 2 roods of the park to the Superintendent for the purpose of a hospital, this being the higher land at the corner of Antigua Street and Riccarton Road. By the Christchurch Hospital Act of 1887 this land and nearly eight acres more were vested in the North Canterbury Hospital Board in fee-simple, the extra eight

acres being for the purpose of a fever ward, kitchen-garden, and pleasure-grounds, it being especially stipulated that no buildings were to be erected there without the consent of the Domain Board.

Although strictly speaking the original reserve includes this whole area, in this paper only those parts of it now known as “Hagley Park” and the “Botanic Gardens” are dealt with botanically. Hagley Park is divided into North and South Parks, which are separated by Riccarton Road. The North Park is bounded on the south by Riccarton Road, on the west by the West Belt, on the north and east by the River Avon. A small plantation, known as Helmore's Plantation, is cut off on the north of North Park by a public road. The South Park is bounded by the South Belt, the West Belt, Riccarton Road, and Lincoln Road. In the same block of land as the North Park are the Botanic Gardens. On the north these are bounded by a straight line running at right angles to Rolleston Avenue along the College boundary-fence as far as the river, thence by the river itself to the south end of Rolleston Avenue again.

The exact areas of these various portions are rather difficult to determine from the records. In the *Lyttelton Times* of the 20th April, 1852, the Land Office of that day advertises the 445 acres of Hagley Park as available for depasturing, at a rental of 2s. 7d. per acre. The Government Domain, of 64½ acres, is also advertised, at a rental of 4s. 7d. per acre. Whether this Government Domain is part of the original reserve and is the area now occupied by the Botanic Gardens is not quite certain, but, assuming that it is, the total area of the reserve as surveyed in those days would be 509½ acres. This is greater than any later estimate. By the

Public Domains Act, 1895, the area of Hagley Park and Domain is described as originally 495 acres. This includes the ten acres vested in the Christ's College authorities, the Hospital ground, and also the areas occupied by the roads through the Park, altogether 35 acres, leaving under the direct control of the Domain Board 460 acres. In 1905 the North Park was surveyed by Mr. N. C. Staveley, of the Canterbury College Physics Department, and in 1906 the South Park by students of the Engineering School, under Mr. W. F. Robinson, and the areas were computed as follows: North Park, 210 acres; South Park, 174 acres 1 rood 4 poles: total, 384 acres 1 rood 4 poles. The accompanying table shows the latest areas recorded for each division of the original reserve:—

	A.	R.	P.
North Park	210	0	0
South Park	174	1	4
Christ's College	10	0	0
Museum	1	0	26
Magnetic Observatory	0	2	13
Domain Garden	51	1	38
Hospital	13	2	18
Acclimatization Society	10	0	0
Total	471	0	19

Subtracting from this total the areas handed over to Christ's College and to the Hospital Board, a total of 447 acres 2 roods 1 pole is left under the control of the Domain Board,

thus making a shortage of 22 acres 1 rood 39 poles from the estimated 460 acres of 1895.

Early History.

The administration of the land of the public reserves was at first in the hands of the Land Office. The earliest reference found was in the *Lyttelton Times* of the 3rd April, 1852, where, over Mr. W. G. Brittan's signature, was the advertisement for receiving tenders to depasture "the land known as the Town Reserve surrounding Christchurch, Hagley Park, and the Government Domain." The Town Reserve and the Government Domain here referred to were later disposed of in other ways, but Hagley Park still remains. In the same issue of the *Lyttelton Times* was an account of a cricket match in Hagley Park between the married and the single men of the settlement. A subscription was taken up during the afternoon to make a proper ground and fence it in, "the present place being rough in the extreme and very difficult to play on." A sum of £30 was collected, which was presumably spent in this way. In a later issue was an advertisement of races to be held in Hagley Park on Easter Monday of the same year. This was accompanied by the statement that the course had been much improved since the last races held there. Again, on the 25th December, 1852, appears an account of the "farewell breakfast" tendered to Mr. and Mrs. Godley on the eve of their departure for England. This took place in Hagley Park in the spacious marquee which had been erected for the Horticultural Exhibition, of which no other mention can be found.

It would seem, therefore, that the Park was early used for one of the purposes for which it had been set aside—namely, as a recreation-ground for the townspeople; and to a certain extent the ground must have been prepared for this, cleared of some at least of the thick growth with which it had been covered when the town was first laid out. Details, however, as to this are lacking. Stock of all kinds were freely pastured on this ground, for the action of the Association in charging for the right to pasture on Hagley Park provoked the complaint from one correspondent that the price of milk was high enough as it was without any extra charge in consequence of rents dairymen had to pay. Later on the long grass was cut, and haystacks were a common feature in the parks.

In 1855, by the Canterbury Association Ordinance before referred to, the Superintendent was given power to set aside what land he thought fit for plantations, gardens, &c., but nothing seems to have been done in this direction before 1864. On the 10th May, 1864, a public meeting was held in the Town Hall for the purpose of forming the Canterbury Horticultural and Acclimatization Society, and it was decided that Hagley Park was a suitable site on which to form a botanic garden. The Provincial Government was approached, and a Commission, consisting of Messrs. Hall, Sewell, Miles, and Hill, was appointed “to promote the cultivation and planting of the Government Domain in connection with the objects of the Acclimatization Society.”

In early days the Commission (later known as the Board) acted as an advisory committee to the Superintendent, but in 1872 the power of administration was vested in the

Board itself. The various Acts of 1872, 1881, 1895, 1908, and 1911 have all dealt with the administration of this Christchurch reserve, and have further defined the extent of the Board's authority over the land.

At the first meeting of the Commission it was unanimously agreed that the ground under control of the Commission should be trenched and planted without delay. The Government Gardener, Mr. Barker, undertook the supervision of the work for the Commission. The portion of the reserve decided on as suitable for acclimatization and horticultural purposes was that lying between Christ's College grounds and the river, and steps were taken to have this fenced off with Van Diemen's Land palings, trenched and dug, while the Provincial Secretary was requested to have the cattle removed which were then depasturing the ground. Due attention was paid to the requirements of the Acclimatization Society as to aviaries and ground for pasturing any animals. Native plants were offered by a gardener at Akaroa at the rate of 6s. to 14s. per hundred, and £30 was voted to be disbursed in the purchase of the same. Dr. von Haast presented seeds he had received from Sir W. J. Hooker, Director of the Kew Gardens, and other private individuals made presents of seeds and plants.

A vote of £1,000 had been granted by the Provincial Government for the carrying-out of the work, and at the outset the finances appeared to be in good condition.

Frequent gaps occur in the minutes of the first few years. In 1867, however, it is recorded that Mr. Barker asked to be relieved of his duties as Government Gardener, and the late Mr. J. F. Armstrong was elected as his successor. Mr.

Armstrong acted as curator till 1889, and during the greater part of his twenty-two years' service he was assisted by his son, Mr. J. B. Armstrong, who had charge of the nursery work.

History of the Domain.

The Domain when Mr. J. F. Armstrong took over the management presented a very different appearance from that of to-day with its trim, orderly beds and wide green lawns. A paling fence separated it from Antigua Street, and close to it was a very thick belt of willows and poplars. Over a hundred were taken out from the frontage between Worcester and Hereford Streets. The Museum building and the Gardener's cottage had not then been erected. Three sand-dunes were very conspicuous, one occupying the site of the present Museum, a large one where the first grove of pines (*Pinus Pinaster*) now stands, and a smaller one between these two. Those behind the Museum have since been levelled, but the knoll on which the pines stand still shows something of its original form. All these sand-dunes were covered with fern, amongst which showed an occasional *Discaria*. A huge shingle-pit occupied the greater part of the area now covered by the wide front lawn, and supplied much of the metal for the city streets. There were no flower-beds of any kind. A few of the older trees were there then; the tall *Eucalyptus* on the river-side near the Gardener's cottage was one of these, and the Prince of Wales's oak farther down the path.

It may be of interest to note that the oldest of the trees planted in the Domain and Park, such as the sycamores, oaks, and elms, were imported from England as trees. They

came out in big wooden cases, having been removed from the English nurseries during the resting season. On arrival after their six months' journey they were at once put into the river to revive before planting. The stronger of them lived, and grew when planted out, but many died. As soon as it was possible all trees for planting in the Domain were raised in the nursery of the Domain either from seed or from cuttings or layerings. This work, as mentioned above, was in the charge of Mr. J. B. Armstrong, and trees of his raising may be found in all parts of the Park and Gardens. The line of wellingtonias extending from the river to Riccarton Road by the United Tennis and Bowling Club's grounds were all raised from seed in 1873. The beautiful Oriental planes in the avenue leading to Riccarton Road were reared as cuttings, and the limes of the South Park as layerings, in 1873 and 1874. In addition to the work of raising seedlings and trees for the Domain and Park, thousands of young trees were distributed from the Christchurch Gardens to various public bodies in all parts of the colony. In 1881 it was estimated that the number that had thus been gratuitously distributed by the Domain Board during the previous twelve years was 694,972. Later this work had to be discontinued owing to lack of funds.

During the years following 1867 many trees were planted both in the Domain and Parks; flower-beds and lawns were formed in the Domain, and the main paths laid down as they now are. This entailed much hard work, for the whole area was practically uncultivated. The bed just inside the gates which is now so gay with flowers was a deep bed of shingle, all of which had to be removed and replaced by good soil. The College border was amongst those formed, and still contains many trees and shrubs planted at that

time; the River border was also formed about the same time, and the Fern border also was prepared for the reception of tree-ferns. A number of these are still to be found there in company with a tangled mass of other native and foreign vegetation, and the whole, as it stands, somewhat resembles a piece of native bush, where the young seedlings of the various trees find a congenial home.

The names of Mr. J. F. Armstrong and of his son will be always connected especially with that portion of the Gardens now known as the "old native section." About 1875 Mr. J. F. Armstrong proposed to lay out the two acres hitherto used as a nursery for the cultivation of the New Zealand trees, shrubs, and herbaceous plants, for, as he said, "there are in the colony many beautiful and interesting plants, which it is desirable to preserve from the destruction which is fast overtaking the indigenous flora." He proposed to plant the species in hand in botanical order, and fill up as others should be obtained. A very large collection of valuable plants was brought together here, many of them being collected from their native homes by the son, who took long and arduous journeys for that purpose.

Much of the history of this native section was given many years later by Dr. L. Cockayne in an article entitled "The Native Section, its Value and Possibilities," published in the *Lyttelton Times* of the 12th June, 1911. Dr. Cockayne stated that the function of a native section such as that formed by the Armstrongs was "to form a living museum of botanic material which students could consult; to be a pleasing adjunct to the Gardens; to show that native plants could be cultivated, and were equal to expensive exotics;

and, finally, to supply seeds for exchange purposes with horticultural establishments abroad. And right well has it served those purposes.” “Through the material collected in this way,” the article continues, “Mr. J. B. Armstrong sprang into the front rank of New Zealand botanists by his bold and excellent paper on the New Zealand veronicas, in which he foreshadowed De Vries's mutation theory.” Material from this section has been extensively used by Cheeseman, Petrie, and Cockayne, among New Zealand botanists; while seeds collected here have been sent abroad to Edinburgh, Kew, and other great national gardens. This native section is known far and wide throughout the world, and has been visited by many scientific men from all parts of the globe. Since ornamental plants form only a small percentage of the native flora, a native garden cannot be limited to these, or it would give little idea of the New Zealand flora. To be educational it must contain as many plants as can possibly be got to grow there. Farther on in the article the writer states that the native section is one of the horticultural landmarks of the Dominion, and contains abundant material for research, at the same time forming a wonderful object-lesson as to how plants from the most different habitats—swamp, rock, river-bed, forest, scrub, low-land, seashore, and mountain—can not only tolerate but enjoy conditions absolutely different; and, in conclusion, he asks that the time-honoured native section should be as religiously preserved and well tended as the new one, and also added to, so that together they may form the most extensive and complete collection of New Zealand plants that has yet been brought together.

During the terms of office of the following two curators—Mr. A. Taylor (1889-1907) and Mr. J. Dawes (1907-8)—very little seems to have been done beyond keeping the grounds in order, owing principally to the want of funds and consequent lack of skilled workmen. Indeed, on several occasions the only assistants the Head Gardener appears to have had were men supplied by the Charitable Aid Board, and these were too infirm for any but the lightest work.

During the years (1908-19) in which the present curator, Mr. James Young, has been in charge many extensive changes have taken place in the Domain and Parks. In the Domain the beds are gay in the different seasons with the various annuals. The new native section, with its luxuriant growth of native plants, is an important addition for the student; the rose-garden, with its wealth of blossoms of every hue, its trim walks and well-kept beds, delights the rose-lover; while the recent addition in the shape of a children's playground, with its paddling-pool and swings, delights the hearts of countless children and is a boon to many a parent. Many other changes are in prospect, and all are possible only by reason of the increased funds at the disposal of the Board. These are obtained by votes from local Boards and Councils, and also from the proceeds of the annual fêtes, instituted on the suggestion of Mr. Young.

The history of all the plants in the Botanic Gardens is beyond the scope of this paper. It will be sufficient for the purpose in view to add a few facts only concerning the planting of the historic trees or plantations.

The Historic Trees of the Domain.

The first tree to be planted in the Domain was the oak still to be found close to the river, to the south-west of the archery-lawn. This was planted on the 9th July, 1863, to commemorate the marriage of the late King Edward, then Prince of Wales. It is known as the Prince Albert Edward oak. On the same day other oaks were planted in different parts of the town; two of these are still to be found in the grounds of the West Christchurch School. The one in the Domain is now a huge tree, with a trunk over 10 ft. in circumference, its branches spreading across the path. It can be easily found and identified by the brass plate fitted into a strong post which stands in front of it. The brass plate dates from the planting of the tree, but for many years it was allowed to become so discoloured as to be almost undecipherable. It has recently been fixed in its present place, and the rubbish cleared away from the tree so that its beauty may be clearly seen.

The next trees of historic interest are those planted by the Duke of Edinburgh on the occasion of his visit to Christchurch, in 1869. It had been arranged that His Royal Highness was to plant the oak near the centre of the first lawn, and four other trees were to be planted in different places later on in the day. When this was made known to the Royal visitor he insisted on planting them all. The oak is known as Prince Alfred's oak, and is still to be seen in the centre of the front lawn. His Royal Highness specially requested that this tree should never be touched with knife or axe, and, though it badly needed it, Mr. Armstrong would not allow it to be touched during his period of office. Since then, however, it has been pruned and has been much

improved thereby. Of the other four trees, the *Wellingtonia gigantea* alone remains, and is seen farther to the north of the same lawn; the cedar of Lebanon, the *Cedrus deodora*, and the totara have since died. As Mr. Armstrong quaintly remarked many years ago, the possession of five Royal trees was too much honour for one garden to sustain.

The *Araucaria imbricata* just to the south of the Moorhouse statue was planted in 1871 by Sir George Bowen, then Governor of the colony. He planted four other trees — an oak near the north-west corner of the enclosure near the College grounds, which was cut down in 1893 and replaced by an elm; an ilex oak, which is still standing on the grass plot near the Winter Garden; and two others.

The Marchioness of Normanby's tree is the cedar of Lebanon on the lawn near the Museum path, not the *Cedrus deodora* which is at present labelled with her name. That tree was planted later, in 1880, to celebrate Mr. J. F. Armstrong's sixtieth birthday. It is apparently almost as big as the other cedar, for it has made quicker growth. The Marquess of Normanby planted an oak seedling at the end of the archery-lawn on the same day, and this has since grown into a fine tree. It is to be found just beyond the limes.

On the 6th June, 1893, an oak was planted on the triangular lawn near the Gardener's cottage to commemorate the marriage of Their Royal Highnesses the Duke and Duchess of York. This oak was planted by the chairman of the Domain Board, Mr. H. P. Murray Aynsley, who served for many years in that capacity on the Board and devoted

much time and thought to the welfare of the Domain and Parks.

In August, 1902, an oak was planted to commemorate the coronation of King Edward VII. This is now a fine tree, near the north-east corner of the rose-garden, and can be easily distinguished by the stone, suitably inscribed, which has been placed in front of it.

On the 23rd June, 1911, an oak-tree was planted by Mrs. H. J. Beswick near the south bridge to commemorate the coronation of King George V. In 1917 Lord Liverpool planted a Spanish chestnut near the South Domain Bridge. This ceremony was the initial step towards the proposed rock-garden.

There are probably several other trees of historic interest in the Domain which are not properly identified, and it is to be hoped that the Board will act on the proposal made in 1910 to find them out and keep a record of them, making plans of the Domain to show their position, as suggested in the proposal.

On more than one occasion these and other trees and plants have been named and labelled by the various curators, but a section of the public, with a wanton disregard of their privilege in protecting one of the most beautiful assets of their city, constantly destroy these labels either by removing them altogether or throwing them about in other parts of the gardens. Over and over again in the minutes of the Domain Board has this destruction been referred to; it is probably only the more solid nature of the labels in front of some of these memorial trees that has preserved them

from the same treatment. This is a serious disgrace to the perpetrators, as is also the deliberate removal of many plants from the beds, which also has been reported from time to time. The public should be made to realize that the beauties of the Domain are theirs to enjoy and to protect in every way.

Buildings in the Domain.

Some mention perhaps should be made of the buildings and other structures of a permanent character found in the Domain. In 1869 the first buildings of the Museum were erected. These faced the front lawn of the Domain. The front rooms and new entrance off Rolleston Avenue were added at a later date. The Board of Governors of Canterbury College, to whom the Museum buildings belong, have no title to the land on which the buildings stand, and this has hindered the erection of additional buildings. In 1872 the Gardener's cottage was built on its present site, and various alterations have been made from time to time, the last being the addition of a Board-room. In 1874 the attempt of the Provincial Council to take another portion of the Domain for the erection of Canterbury College led to the resignation in a body of the Board, who thus protested against the alienation of the reserve from the purpose for which it had been set aside. Public protest also led later to the abandonment of this project.

The sun-dial must have been placed in the Domain quite early in its history, for no mention can be found of it in the minutes. It is said that it was presented by Mr. W. Guise Brittan, who brought it out from England with him. It stood

originally where the Moorhouse statue now stands, but was moved to its present position in 1873. The Moorhouse statue was set up in 1885 after some discussion as to the suitability of its being placed in the Domain. In 1902 the Magnetic Observatory was built and a small portion of the grounds fenced off surrounding it. The Rolleston statue was placed in position in front of the Museum and fronting Worcester Street in 1905. In 1908 the Old Colonists' Association applied for and received permission to erect a stone pillar with a brass plate in the Pilgrims' Corner. This led to some discussion as to the actual place which should be known by that name. In 1913, out of the funds bequeathed to the Beautifying Association by the Hon. J. T. Peacock, an elaborate fountain was erected. It was originally right on the path, but was later moved to its present position and the pond then formed round it. The Winter Garden consists of the conservatory and orchid-house from Holly Lea, and was presented to the Domain by Mrs. A. Q. Townend in 1914.

The present nursery grounds and buildings were taken possession of in 1875. Previous to this date the nursery was situated on the ground now occupied by the old native section.

The above gives a very brief history of the Domain, but naturally it cannot be treated exhaustively from a botanical standpoint. The gardens contain much of great interest to the student of plants from his own and foreign lands. In this paper, however, the writer is attempting to trace the changes that have taken place in the vegetation from its virgin state to the present day, with a more particular account of what native plants may be supposed to have

maintained their existence from that time. It would be very unlikely that any of our indigenous plants could have managed to exist under the conditions that have prevailed in the Domain since it has been so carefully cultivated, though it is possible that a very few might be able to re-establish themselves if the soil were allowed to lie waste. Nearly all the indigenous plants that are to be found to-day in the original reserve are in that part of it known as the North and South Hagley Parks.

History of the Park.

The various events of historical interest that have taken place in the Park have all had their influence on the vegetation, and will be considered briefly. The first, already referred to, was the “farewell breakfast” tendered to Mr. J. R. Godley in the end of 1852. Thirty years later—that is, in 1882—the South Park was the scene of the Industrial Exhibition. The large entrance-gates, presented by the promoters of the Exhibition, Messrs. Joubert and Twopenny, now form the entrance at Hereford Street, being erected there in 1883. In 1901 there was a great military review in North Park, held on the occasion of the visit of Their Royal Highnesses the Duke and Duchess of York. In Coronation year, 1902, a huge bonfire was made in North Park, between the Armagh Street entrance and the lake. In 1905 the buildings for the International Exhibition were commenced and land enclosed for grounds. These extended from the South Domain Bridge, near the lake, to Carlton Bridge, and in the Park from a point commencing on Helmore Road. This ground consisted of a total of 116 acres—86 acres of free ground, five acres of lake, and 25 acres of plantation. In 1910, at the time of Lord Kitchener's

visit, a Volunteer camp was held in the North Park. On all these occasions there was of necessity a great disturbance of the soil and destruction of vegetation. One of the conditions laid down in each case by the Board was that the ground should be restored to its natural state when the period of occupation was completed; but this was not possible in every case, and a few of the native plants were lost for ever to the Park on more than one of these occasions.

In 1897, the Diamond Jubilee year of Queen Victoria, the piece of swamp near Armagh Street was formed into a lake and named Victoria Lake after the Queen. It consisted when finished of five acres of water, and was three feet deep. The formation of such a lake had been suggested in 1874 by Mr. R. Wilkin, then a member of the Domains Board, but his proposal had not been agreed to. In 1916 the smaller lake to the north was formed as at present, the soil having been removed to improve the border on Rolleston Avenue. There was some trouble at first as regards the water-supply feeding Victoria Lake, but Mr. Young has made use of the 1906 Exhibition deep wells to feed both Victoria Lake and the smaller lakelet beside it.

From a botanical standpoint the destruction of this swamp is much to be regretted, for it contained very many of the indigenous plants which have since that time been lost to the neighbourhood of Christchurch. Such a piece of swamp quite close to the centre of the town would be always easy of access to the student, who now has to go much farther afield in search of bog-plants.

The Park was also used by Volunteer corps as a camping-ground; and, as the first records show, it has been used from the earliest days of the settlement as a sports-ground. The cricket clubs were the first to make use of it, and the South Park has been the scene of their activities from 1867. Later the polo club and the hockey clubs obtained the use of certain portions of the same park. The North Park has been used by various football clubs, golf clubs, and tennis clubs. The latter have laid down permanent courts and erected pavilions of a more or less permanent character. At first, however, the Boards granted the use of the Park only on condition that no buildings of a permanent nature should be erected, and more than one football club was requested to remove the structures it had put up. In every way an effort was made to guard the reserve from any attempt to appropriate any portion of it for the few: it was to be held in trust for the public as a whole. It is to be hoped that the people of Christ-church will in the future be equally as careful to preserve these public grounds which the forethought of the early colonists set aside for their use.

In 1888 four cricket clubs in South Park and eight football clubs in North Park together occupied 49 acres. In 1913 the approximate area of sports-grounds was estimated at 68 acres.

The Soil of Hagley Park.

The nature of the soil on which any plant association is found is always important in the study of the plants forming that association. The soil of Hagley Park is for the most part very sandy, with patches of shingle and smaller areas of swampy ground, though the latter is not now so

extensive as it once was. Geologically the Park belongs to the Canterbury Plains, and some account of their formation has been taken from Sir Julius von Haast's report of 1864.⁴

After describing the probable state of this South Island during the Tertiary and succeeding glacial periods at the close of which the Canterbury Plains began to be formed by the deposits carried down by the glacier torrents, he postulates the formation of a huge lagoon extending from the Rakaia to the Waimakariri. This he considered was formed by a bank composed of deposits of sand and silt carried down by the glacier torrents and so enclosing an arm of the sea. The bank was added to by the drift sand along the coast. Of this lagoon only Lake Ellesmere now remains. The rest has been filled up partly with deposits of silt or glacial mud brought down by the big rivers Rakaia, Selwyn, and Waimakariri (all of which he considered emptied into this huge lagoon), partly by deltas formed by these rivers, and also by the invasion of drift sand from the seashores. By slow upheavals swamps were probably formed, giving rise to extensive beds of peat, by means of which the ground gradually became still higher, so as to offer the necessary conditions for the growth of the kahikatea (white-pine) (*Podocarpus dacrydioides*) and other forest-trees, whilst in the intersecting channels between the dry lands the deposits of silt were still thrown down to form beds of clay and loam (p. 55).

⁴ *Geological Reports to the Provincial Council of Canterbury: 2. Report on Formation of Canterbury Plains, Session XXII, 1864.*

The swampy ground on which *Podocarpus dacrydioides* established itself is farther to the north and west of Hagley Park, but certain small areas within the Park are still swampy, and Victoria Lake marks the site of the largest swamp of more recent years, which for long was an eyesore to the beauty-loving section of the Christchurch public, but, as mentioned above, formed the home of many of our native swamp-plants. The other swampy areas are indicated by the presence of the sedge *Schoenus pauciflorus*. The greater part of the Park, however, is shingly or sandy in character. The shingle has proved a source of revenue to the Domain Boards for many years, while the sand is everywhere present at a greater or less depth from the surface. This sand was a serious trouble to the early Boards. The question of how to stay its inroads or prevent its drifting was at length answered by the happy suggestion of one Board member in 1881 that the City Council be asked to deposit all grass scrapings from the streets on such areas. That apparently settled the difficulty, for no more complaints concerning sand-drifts are heard in the Board meetings. Instead, complaints of a different nature were heard, to the effect that the City Council were exceeding their privilege by depositing more than grass scrapings, and so making of the Park an unsightly dumping-ground for all kinds of city refuse.

The surface soil of the Park to-day is very different from what it was sixty-nine years ago, when the reserve was first set aside. By 1865, according to Mr. Armstrong's recollections, South Park had been sown down and partially levelled. North Park was much more uneven, the soil much poorer, and drift sand abundant. It was covered by very slight vegetation. Now, by this year 1919, every

square inch has been dug or ploughed over more than once. Loads of soil have been carted from the Park to the Gardens for flower-beds and to form the present paths of Rolleston Avenue. Still other loads of city refuse have been deposited in different parts of the Park and covered over with soil, at first for the purpose of settling the drift sand. Deep excavations have been made for the purpose of laying electric cables or in the erection of earthworks for the Volunteer Engineers in days gone by. Certain parts of South Park have been cropped, and in later years extensive areas have been planted in potatoes with the idea of clearing the ground, levelling it, and preparing it for sports-grounds. Other existing sports-grounds have been levelled and sown with grasses. The ground on which the Exhibition buildings were erected has been thoroughly disturbed, and several native plants have been seen no more since that time. The laying-down of tennis-courts, cutting hay, grazing, occasional bonfires—all have had a share in changing the character of the soil and consequently the plant covering.

The Plant Covering.

In considering the plant covering of the Park it will be best to speak first of the trees forming the plantations and avenues, then of the herbaceous plants, paying most attention to the indigenous plants which are still to be found growing here, and which may be considered as having formed part of the original plant covering. It is chiefly to form some printed record of what is known of these plants that this paper was taken in hand.

First, then, some history is given of the planting of the trees. According to the minutes of March, 1904, Mr. H. P. Murray Aynsley stated that the avenues in the Parks had been planted in the hope that some day a proper drive would be formed round the Park. Some plantations must have been in existence in 1867, for in that year application was made for the use of the grass growing within the plantations, and later in the same year trespassers were reported to be injuring the trees. In 1868 there is a record of the damage caused to the plantations by the turkeys and pigs which had been allowed to run there. The first mention recorded of the actual planting in the Park was in the autumn of 1870, when land was enclosed for an avenue to extend from a plantation (probably the pine plantation west of Victoria Lake) to the entrance near Plough Inn. That is now the avenue of Oriental plane trees which is one of the beauties of the North Park. As stated above, these plane-trees were raised from cuttings by Mr. J. B. Armstrong. A plantation of an acre was made also on the high ground and sandhills north of the footpath. This was of pines, and is still in existence as the pine clump to the north of the lake. That same season instructions were given that "the waste ground north of the road near Carlton Bridge be enclosed and planted with pines." This is what is known now as Helmore's Plantation. The pines in the corner by Carlton Bridge were also planted at this time.

The following year, 1871, saw the plantation at the south-west corner of the South Park formed from trees removed from the avenues along Lincoln and Riccarton Roads, the plantation along Riccarton Road completed, and two small plantations formed on the south side of the road leading to

Carlton Bridge. A shingle-pit in the park was also enclosed with a substantial fence and planted with fir-trees.

In 1875 the Head Gardener reported the fencing-off of ground and the planting of a new avenue from the north entrance of the Park along Riccarton and Lincoln Roads, thence along the South and West Belts to Washbourn's Creek, and the continuation of the avenue walk from Lincoln Road along the South to the West Belt. The lime-trees along the north side of the Park were reported to have been destroyed by hares which had escaped from the Acclimatization Society's grounds.

This year (1875) it was also suggested that the avenue in front of the Domain and College should be added to Antigua Street by removing the old fence, the holly fence just within if reinforced with wire netting being sufficient to keep out dogs. Though the completion of this work is not recorded, it probably was carried out during that season, adding greatly to the beauty of what is now known as Rolleston Avenue. This avenue includes some of the oldest trees, planted originally by Mr. Barker. The chestnut-trees from Worcester Street to Gloucester Street are especially beautiful during the flowering season. It is worthy of record that this avenue occupies ground that was originally marked off as a reserve for a mill-race to extend from the river at Armagh Street to the river at the Hospital grounds, and it is occasionally referred to in the early minutes as a "canal reserve." This plan of forming a canal was soon dropped, and on application from the City Council the "canal reserve" was formed into a footpath.

In 1876 it was decided to replace the more common cork-bark elm and ash trees growing in South Park opposite the Saleyards with English elm and *Pinus radiata*, the latter to act as nurses. These latter have been cut down for some years, and the English elms are left.

The grove of trees between the South Bridge and the Riccarton Road was in 1902 named the Harman Grove, in memory of Mr. R. J. S. Harman, who had rendered valuable assistance to the Board for the many years during which he had served as chairman.

In 1904 Mr. M. Murphy suggested the appropriation of three acres between Victoria Lake and Armagh Street as a plot for making a collection of hardy trees and shrubs of Australia, but his proposal does not appear to have been acted upon.

Beyond this the minutes make no further record of planting trees in the parks, but much attention has been paid to the proper care of those already planted. These have been pruned or thinned out as need arose, often amid cries of vandalism from the critics who thought they knew better than those whose work it was to attend to these matters. The trees of avenues and plantations to-day, however, are for the most part in a healthy condition, many of them adding greatly to the beauty of the city reserve. The lime avenue of the South Park and the Oriental plane avenue of the North Park and the Rolleston Avenue are especially worthy of mention.

The rest of the area of the Park, excluding the trees and the potato patches, is pasture-land suitable for sheep. The

greater proportion of the plants to be found there at the present day are therefore introduced grasses and fodder plants. Chief among the introduced grasses are species of *Agrostis*, *Festuca*, *Lolium*, *Dactylis*, *Cynosurus*, &c., together with many of the more useless grasses, such as species of *Holcus*, *Bromus*, and *Hordeum*. This latter (*H. murinum*) has spread considerably in certain parts, notably in the pine plantation to the north of Victoria Lake. Amongst the leguminous plants can be found several species of *Trifolium* and *Medicago*. The common crucifers *Capsella* and *Sisymbrium*, the composite *Achillaea millefolium*, and the ordinary composite weeds *Senecio*, *Cnicus*, *Taraxacum*, &c., are abundant. *Plantago major*, *Polygonum Convolvulus*, and *Rumex* spp. are present, while in one portion the lupin is gaining ground.

Most of these weeds belong to the class of plants that occur in any waste land, or in permanent-pasture land that is left to itself for any length of time. Their fruits or seeds are easily carried by wind or animals from one place to another. In some cases they were probably introduced as impurities of the grass-seed sown.

More important for the purpose of this paper is the record of the indigenous plants that have been collected in the Domain or Parks from time to time. Such lists naturally exclude all indigenous plants that may have been planted purposely, such as those that are found in the native sections of the Domain. Only those that from their position now may be considered to have formed part of the original flora of the reserve will be mentioned in these lists. A comparison of their contents will give some idea of the ability of New Zealand plants to hold their own in the face

of the European intruders, and of their prospective ultimate fate in the struggle for existence.

The published records are very scanty, but I am deeply indebted to Mr. J. B. Armstrong for permission to use a list he made in 1864 of the indigenous flora of Hagley Park and Domain, a list which has hitherto been in manuscript only. This is given below (list A).

The first reference to the plants is that given above⁵ in the description of the vegetation through which the pioneer party had to force a way, and probably it is descriptive rather of the country lying farther to the west of Hagley Park, though some of the plants would be common in the Park. The “fern” would be the common *Pteridium esculentum*, or bracken, found in all waste places on the Plains. The “tutu,” *Coriaria sarmentosa*, used to be found in patches along the river. The “tussock,” *Poa caespitosa*, is still to be seen in certain parts of North Park. The “bramble,” a term applied usually to the various species of *Rubus*, has not been recorded actually from the Park. The “spaniard,” *Aciphylla squarrosa*, has disappeared only recently.

This casual reference dealt only with the more prominent constituents of the flora; the smaller herbaceous plants, not causing any trouble to the pioneers, were not noticed at all.

The next list in point of time is that supplied by Mr. J. B. Armstrong, which gives the names of the plants present in

⁵ *Canterbury Old and New*, p. 50.

both Park and Domain in 1864. The Domain was at that time in the same uncultivated state as the Park—in fact, it was in a more natural state than the South Park, which had been cropped before that date, with the consequence that it was rather poor in native plants. In some cases where the names given by Mr. Armstrong differ from those in Cheeseman's *Manual* the latter are given also in square brackets, as are also some additions. The species marked with an asterisk are given by Mr. Armstrong, and have therefore been included in the list, though some authorities express a little doubt as to the correctness of the identification.

List A.—Indigenous Flora of Hagley Park and Domain, Christchurch, in 1864.

Trees.—None

Shrubs.

Locality.

<i>Coprosma robusta</i> Raoul	River-bank.
<i>Leptospermum scoparium</i> Forst.	A few in the Domain.
<i>Discaria toumatou</i> Raoul	Dry shingly spots.
<i>Coriaria ruscifolia</i> L.	In patches along river.
<i>Olearia virgata</i> Hook f.	A few in Domain.
<i>Veronica salicifolia</i> Forst.	Common along the river.

Herbaceous Plants, Ferns, etc.

<i>Clematis marata</i> Armstrong	Abundant on <i>Discaria</i> .
<i>Ranunculus hirtus</i> B. & S.	River-bank.
<i>R. rivularis</i> B. & S.	Swamp (now Victoria Lake).
<i>R. sessiliflorus</i> R. Br. [probably unintroduced]	Sandy spots, North Park.
<i>Cardamine hirsuta</i> DC. var. <i>a</i> .	River-bank.
<i>Viola Cunninghamii</i> Hook. f.	Swamp.
<i>Hypericum japonicum</i> Thunb.	Sandy spots, North Park.
<i>Geranium dissectum</i> L. var.	River-bank.
<i>Pelargonium clandestinum</i> L'Herit. [= <i>P. australe</i> (Cheeseman)]	Common in Domain and parks.
<i>Carmichaelia nana</i> Col.	Common in shingly places in Domain.
<i>C. flagelliformis</i> Col. [<i>C. subulata</i> T. Kirk]	Grassy places.
<i>Potentilla anserinoides</i> Raoul [<i>P.</i> <i>anserina</i> var. <i>anserinoides</i>]	Swamp.
* <i>Geum magellanicum</i> Comm. [= <i>G.</i> <i>urbanum</i> (Cheeseman)]	Swamp.
<i>Acaena Sanguisorbae</i> Vahl.	Sandy spots, North Park.
* <i>Drosera dichotoma</i> B. & S. [= <i>D.</i> <i>binata</i> (Cheeseman)]	Swamp.
<i>Haloragis alata</i> Jacq.	River-bank.

<i>H. depressa</i> Hook. f.	Shingly places, North Park.
<i>Myriophyllum elatrnoides</i> Gaud.	In river.
<i>M. variaefolium</i> Hook. f. [= <i>M. intermedium</i> DC. (Cheeseman)]	In river.
<i>Callitriche stagnata</i> Scap. [= <i>C. verna</i> L. (Cheeseman)]	Swamp.
<i>Epilobium nummularifolium</i> L.	Wet spots.
* <i>E. alsinoides</i> A. Cunn.	Swamp.
<i>E. microphyllum</i> A. Rich.	Dry sandy spots.
<i>E. junceum</i> Forst.	Dry places.
<i>E. Billardierianum</i> Ser.	River-bank.
<i>Hydrocotyle asiatica</i> L.	Swamp.
<i>H. novae-zealandiae</i> DC.	Wet places.
<i>H. moschata</i> Forst.	Swamp.
* <i>Crantzia lineata</i> Nutt.	Wet places.
<i>Aciphylla squarrosa</i> Forst.	North Park.
<i>Galium umbrosum</i> Forst.	River-bank.
<i>Celmisia longifolia</i> Cass.	Swamp.
<i>Lagenophora Forsteri</i> DC.	Dry places, North Park.
<i>Cotula dioica</i> Hook. f.	Wet places.
<i>C. squalida</i> Hook. f.	Wet places.
<i>Raoulia Monroi</i> Hook. f.	North Park, near lake.
<i>Gnaphalium filicaule</i> Hook. f. [= <i>Helichrysum filicaule</i> (Cheeseman)]	North Park.

<i>G. involucreatum</i> Forst. [= <i>G. japonicum</i> (Cheeseman)]	Wet spots.
<i>G. collinum</i> Lab.	Dry sandy spots.
<i>Erechtites quadridentata</i> DC.	North Park.
<i>Microseris Forsteri</i> Hook. f.	Common in moist sand.
* <i>Sonchus asper</i> Hill	River-bank.
<i>Wahlenbergia gracilis</i> DC.	Common in all parts.
<i>Leucopogon Fraseri</i> A. Cunn.	Loose sand, North Park.
<i>Myosotis</i> sp., undescribed, with yellow flowers [probably <i>M. australis</i> R. Br.]	
<i>Solanum nigrum</i> L.	Common; probably not native.
<i>Mentha Cunninghamii</i> Benth	Wet places.
<i>Plantago Raoulii</i> Decaisne	Dry sandy places.
<i>Scleranthus biflorus</i> Hook. f.	Dry loose sand (Wonderland).
<i>Urtica incisa</i> Poir.	Common on river-bank, Helmore's Plantation.
<i>Microtis porrifolia</i> R. Br.	Common in Domain.
<i>Pterostylis Banksii</i> R. Br.	Swamp only.
<i>Thelymitra longifolia</i> Forst.	Common in dry places.
<i>Lemna minor</i> L.	In water.

* <i>Bulbinella Hookeri</i> Benth.	Along Washbourn's Creek.
* <i>Anguillaria novae-zealandiae</i> Hook. f. [= <i>Iphigenia novae-zealandiae</i> (Cheeseman)]	Shingly spots.
<i>Juncus australis</i> Hook. f. [= <i>J. taquinatus</i> (Cheeseman)]	Wet places.
<i>J. communis</i> L. [= <i>J. effusus</i> (Cheeseman)]	Swamp, &c.
<i>J. bufonius</i> L.	Wet places.
* <i>J. planifolius</i> R. Br.	Swamp.
<i>J. novae-zealandiae</i> Hook. f.	Damp sand.
* <i>Lepidosperma tetragona</i> Lab.(?) [perhaps <i>Eleocharis</i> sp.]	River-bank.
<i>Carex secta</i> Boott.	River-bank.
<i>C. ternaria</i> Forst.	Swamp.
<i>Hierochloe redolens</i> R. Br.	River-bank.
<i>Dichelachne crinita</i> Hook. f.	Both parks.
* <i>Agrostis parviflora</i> R. Br.	Both parks.
<i>A. aemula</i> R. Br. [= <i>Deyeuxia Forsteri</i> Cheeseman]	Both parks.
<i>Arundo conspicua</i> Forst.	River-bank and swamp.
<i>Danthonia semiannularis</i> R. Br.	Both parks.
<i>Deschampsia caespitosa</i> Pal.	Both parks.
<i>Trisetum antarcticum</i> Trin.	North Park.
<i>Poa caespitosa</i> Forst.	Common all over.
<i>Poa</i> n. sp. with purple glumes	Domain only.

Triticum scabrum R. Br. Common in both
[*Agropyrum scabrum* Beauv]. parks.

Ornithopteris esculenta Agardh. [= *Pteris aquilina esculenta* Ch., Domain.
Pteridium esculentum]

Lomaria procera Spreng [= *L. capensis* (Cheeseman)] Along the river.

L. minor Spreng. [a var. of *L. capensis*] River-bank and swamp.

Ophioglossum lusitanicum Willd. Domain.

**O. minimum* Col. Domain only, very rare.

**O. vulgatum* L. Common throughout.

Botrychium australe R. Br. [= *B. ternatum* (Cheeseman)] South Park, common.

This list notes the presence in the Parks and Domain of some eighty-eight indigenous plants, and it is interesting to compare it with the list given below of the native plants that have been noticed in the Parks during the last two years. The two areas richest in New Zealand plants at that time were the big swamp, destroyed later with all its indigenous flora to form Victoria Lake, and the stretch of sandy ground on which the Wonderland of the 1906 Exhibition was built. In both cases the plants that once flourished there are gone for ever.

Mr. T. H. Potts (*Out in the Open*, p. 112) records the occurrence of the fern *Botrychium ternatum* from the Hospital grounds: "Very handsome examples have been got from the space lying between the Christchurch Hospital

and the River Avon. Old settlers will remember that the situation is, or was, rather, of a moist character; the fronds of the plants from this spot displayed a fine decomposed habit." Farther on the same writer records the abundant occurrence in former days of *Ophioglossum vulgatum* about the North Town Belt, and, as seen from Mr. Armstrong's list, it was common throughout the Parks and Domain. It is possible that a close search might reveal its presence even now.

Dr. Chilton has kindly handed over to me a list of some of the native plants growing in North Hagley Park that were noticed by himself and Dr. Cockayne. The list bears the date of the 12th July, 1905. It is as follows: *Poa caespitosa* Forst., *Carex ternaria* Forst., *C. virgata* Sol., *Juncus communis* E. Meyer., *Muehlenbeckia axillaris* Hook. f., *Tillaea verticillaris* DC., *T. Sieberiana* Cheeseman, *Carmichaelia subulata* T. Kirk, *Geranium sessiliflorum* Cav., *Callitriche verna* L., *Aciphylla squarrosa* Forst., *Raoulia Monroi* Hook. f., *Cotula dioica* Hook. f., *Leucopogon Fraseri* A. Cunn.

This does not claim to be a complete list, but is interesting as affording additional evidence of the comparatively recent presence of *Aciphylla squarrosa*, *Raoulia Monroi*, *Muehlenbeckia axillaris*, and *Leucopogon Fraseri*, none of which can be found there now.

Strangely enough, a few patches of *Muehlenbeckia axillaris* are establishing themselves in the front lawn of the Domain. As this was all ploughed up and resown a few years ago, the appearance of this plant must be quite

accidental, and cannot be regarded as a survival of the original flora, though it was doubtless present then.

The only other mention I can find of New Zealand plants in Hagley Park occurs in Laing and Blackwell's *Plants of New Zealand*, 1906. On page 216, in connection with the description of *Oxalis corniculata*, a brief list is given, excluding monocotyledons. The list is as follows: *Oxalis corniculata*, *Carmichaelia flagelliformis*, *Ligusticum (Aciphylla) Colensoi*, *Raoulia Monroi*, *Geranium microphyllum*, *Muehlenbeckia axillaris*, and *Cotula speciosa*. Of these, only *Oxalis corniculata* and *Carmichaelia flagelliformis* are found now, and it is possible, as Mr. J. B. Armstrong says, that the *Oxalis* is the introduced form, not the original New Zealand form of the species. It is, as Mr. Laing states, common in many of the lawns right in the centre of the city, and may have been introduced as an impurity in the grass-seed sown.

Of the other plants which have since been lost, both *Raoulia Monroi* and *Muehlenbeckia axillaris* were present on the sandy ground near the Armagh Street entrance before the 1906 Exhibition, but have not been seen since. *Aciphylla squarrosa* has since disappeared, and *Cotula speciosa* is very evidently a misprint, probably for *Cotula dioica*, which is still to be found in small quantities.

The accompanying list (list B), drawn up in 1918, for which I am indebted to Professor A. Wall, of Canterbury College, includes five species which were not actually found in the Park, but in its immediate vicinity, where freshly turned soil has provided a suitable opportunity for these natives to re-establish themselves, and in each case it

is interesting to note that these plants occur in Armstrong's list. They are enclosed in parentheses. The species marked with an asterisk are present in very small numbers, in some cases only one plant being found.

***List B. — New Zealand Plants found now in
Hagley Park.***

Monocotyledons.

Gramineae:

Danthonia semiannularis, *Poa caespitosa*,
Alepocurus geniculatus.

Cyperaceae:

Eleocharis acuta, *E. Cunninghamii*, *Schoenus
pauciflorus*, *Carex virgata*, *C. secta*, *C. inversa*, *C.
ternaria*, *C. lucida*.

Juncaceae:

Juncus pauciflorus, *J. effusus*, *J. bufonius*,

Orchidaceae:

(*Microtis porrifolia*.)

Polygonaceae:

**Muehlenbeckia complexa*.

Crassulaceae:

Tillaea Sieberiana.

Ranunculaceae:

**Ranunculus hirtus*.

Rosaceae:

Acaena novae-zelandiae.

Leguminosae:

**Carmichaelia subulata*.

Oxalidaceae:

Oxalis corniculata.

Callitrichaceae:

Callitriche verna.

Onagraceae:

*(*Epilobium Billardierianum*), **E. rotundifolium*, *E. nummularifolium*,

**E. nerteriodes*, (*E. novae-zelandiae*).

Haloragaceae:

**Haloragis erecta* [*H. alata* in Cheeseman's *Manual of N.Z. Flora*].

Umbelliferae:

Hydrocotyle novae-zelandiae, *H. moschata*, **H. asiatica*.

Convolvulaceae:

Dichondra repens.

Campanulaceae:

*(*Pratia angulata*), **Wahlenbergia gracilis*.

Compositae:

Gnaphalium luteo-album, **G. japonicum*, *Cotula australis*, *C. dioica*, **Erechtites prenanthoides*. *(*E. quadridentata*).

A comparison of these two more or less complete lists reveals some rather interesting changes. The only grasses common to the two are the tussock *Poa caespitosa* and *Danthonia semiannularis*; the others of list A are not recorded in list B, though it is possible that the species of *Agrostis* may have escaped notice. The little species *Poa Lindsayi* has established itself on the edges of the old native section. It cannot be definitely stated in this case whether it is reasserting itself or whether it has been introduced with some of the plants that have been

transplanted from other parts. It may possibly be the same as the “poa with purple glumes” mentioned in list A. The Cyperaceae are represented in list A by three species, including only two species of *Carex*, against five species in list B. The Juncaceae, again, have five representatives in list A and only three in list B, two of them being common to both. No member of the Orchidaceae is actually found in the Park now, though *Microtis porrifolia* was discovered on the roadside quite near. Mr. Armstrong records that two species, *Microtis porrifolia* and *Thelymitra longifolia*, were common, and that *Pterostylis Banksii* was found in the swamp, which in his description of the localities always refers to that swamp now the site of Victoria Lake. He does not remember ever coming across any species of *Muehlenbeckia complexa*, which, therefore, never formed a prominent member of the primitive vegetation of this district. It is represented now by only one rather sickly-looking specimen on the side of the ditch at the extreme south of South Park, and its presence there may be accidental. All the shrubs given in list A have disappeared, unless a small plant of *Coprosma robusta* is excepted. This was considered to be a garden escape. With the *Discaria* has gone *Clematis marata*, which is usually found in closest association with it. Of the Ranunculaceae only *R. hirtus* is left, and it is found in only one place in South Park and is in danger of extinction. *Carmichaelia subulata*, represented at most by two plants, is also in like danger, its palatability to sheep having proved inimical to its prolonged existence; in fact, it is only very occasionally that it can be found, owing partly to its position amongst the long grass, but chiefly to its being so frequently eaten down. The *Oxalis* has already been mentioned. Mr. Armstrong did not consider the species present in the Park

to be the native one. *Epilobium Billardierianum* was found in the Park, according to list A. In list B it is recorded as being found outside the actual boundaries of the Park, but is included in the list as one that probably occurred there originally. The three hydrocotyles occur on both lists. *Dichondra repens* is rather disappointingly absent from list A. It occurs on list B, and is found in great abundance on a waste sandy rise in the Helmore Plantation. It flourishes there to the exclusion of all other plants, introduced and native, its creeping stems enabling it to claim fresh ground in ever-widening rings each year. It is still found on the Port Hills in many parts, and is also found as a rather troublesome weed in many gardens and lawns. Its presence may have been overlooked by Mr. Armstrong when he was compiling his list, or it may have been overshadowed by other larger plants which have since from various causes died out, leaving the territory free for this tenacious little plant. It is hardly likely that it was absent altogether from the original vegetation, seeing that it is so prevalent in other places. It is interesting to see that *Gnaphalium japonicum* was once more abundant than it is now, when it is represented by only one plant, at the side of Washbourn's Creek, and is at different times eaten down and hard to find. *Wahlenbergia gracilis* is now very difficult to find, but was once very common, as it still is on the Port Hills and in other places.

A comparison of these plants with those still found in areas which presumably were covered by similar vegetation reveals the absence of some that might quite pardonably have been expected to persist. For instance, the small grass *Triodia exigua* is found on the Waimakariri River bed, which greatly resembles the soil condition of certain parts

of Hagley Park. *Carmichaelia nana* is also common in the same locality, but apparently quite absent from the Park.

The question arises as to the ultimate fate of these few natives that have managed to hold their own through so many vicissitudes. Will they all continue to maintain their existence in the struggle, or are they doomed to extinction? Those that are palatable to the stock grazing in the Park and are also accessible to them are probably doomed: these are the *Carmichaelia*, *Haloragis*, *Gnaphalium japonicum*, and *Erechtites*. Others which fortunately possess some property rendering them distasteful to the grazing-animals, or which are provided with some means of vegetative propagation, or with seeds which are easily distributed, will continue to flourish unless actually uprooted and destroyed. The tussock is proof against most things save fire and cattle; the rushes and sedges flourish where damp conditions prevail, and are safe round the margins of the lakes; the *Acaena* and *Epilobium* are provided with easily distributed seeds; the habit of the cotulas is a useful one in elbowing out competitors; and the acrid juices of the hydrocotyles protect them from the horses which are at present their only enemies.

The fact that our native flora does disappear before European plants has been recorded more than once. In 1875, in his *New Zealand Handbook*, Julius Vogel states that “the lower hills, especially of the Peninsula, were rapidly covered with English grass and clover, which spread of their own accord, rapidly killing the native pastures” (p. 127). The reasons for this are not hard to find. In 1882 Mr. T. F. Cheeseman gave some of them in his paper “On Naturalized Plants of Auckland District” (*Trans.*

N.Z. Inst., vol. 15, pp. 268-98). He points out that the advent of European settlers introduced a set of conditions injurious to the indigenous fauna and flora. They destroyed the vegetation to make room for houses, roads, &c. They introduced herbivorous animals, such as sheep, cattle, horses, which rapidly ate down all plants that they found palatable. These might struggle against such treatment for a longer or shorter time, but in the end they perished from this continual cropping, and their place was taken by plants protected in some way from the attacks of animals, either by the possession of thorns or acrid juices, or by others which were able to exist when eaten. Examples of such plants among the natives would be *Discaria*, *Poa*, *Danthonia*, &c. Then, again, the practice of burning large tracts of vegetation destroyed many of the natives, and the native flora had no plants which could take possession of fresh soil laid bare in any of these ways, whereas the European weeds found here an environment quite suited to them and for which they had been modified for many years.

When this is remembered it is astonishing not that we have so few native plants still remaining in our Park but that we have so many. Grazing-animals were introduced here almost at once: part of the Domain known as the "old pinetum" is the site of an old deer-paddock. Pheasants and hares introduced by the Acclimatization Society worked havoc in Domain and Parks, and much damage was caused in early days by pigs, while sheep have been grazing continuously for sixty-nine years.

An interesting experiment, suggested by Professor Wall, would be the enclosure of a suitable portion of the Park where the native plants should be given every opportunity

of living under conditions as similar as could be obtained to those originally existing in the Park. European weeds should be removed, and native plants now no longer found in the Park but originally growing there should be obtained from such places as the Waimakariri River bed and encouraged to grow in this enclosure. The number of plants that could re-establish themselves under these conditions could then be determined. The place need not be an eyesore to the general public, and the horse-paddock now existing would be a very suitable site for such an experimental plot. Needless to say, the scientific value of such an experiment would be very great.

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